

ABSTRACT

5 A liquid crystal shutter comprises a liquid crystal device
including a nematic liquid crystal sealed in between a first transparent
substrate and a second transparent substrate on whose inner surfaces are
formed respective transparent electrodes, the liquid crystal device having
a twisted angle equal to or greater than 180° ; and a pair of polarizing
plates between which are sandwiched the first transparent substrate and
10 the second transparent substrate, the polarizing films having respective
absorption axes (13, 14) which are substantially orthogonal to each other,
the absorption axes (13, 14) of the polarizing films being angled within a
range of $\pm 40^\circ$ to $\pm 50^\circ$ relative to a direction (12) in which intermediate
liquid crystal molecules are orientated, the direction indicating a
15 direction of orientation of the liquid crystal in the intermediate portion in
the direction of thickness of the liquid crystal device. Alternatively, $\Delta n d$
may lie within a range of 600 to 900 nm, $\Delta n d$ being the product of a
birefringence Δn of the nematic liquid crystal and a gap d between the
first transparent substrate and a second transparent substrate.

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